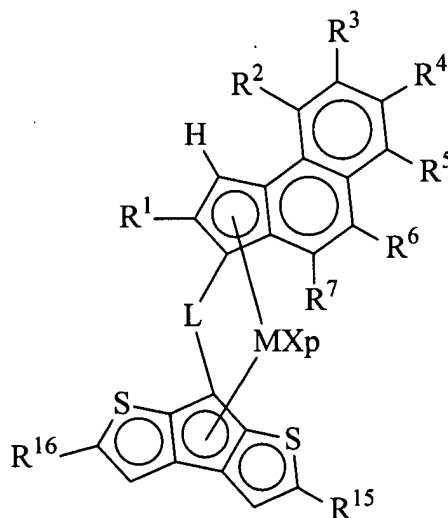




ATTACHMENT A

Claims 1 - 23: (Cancelled)

24. (Currently Amended) A metallocene compound of
~~comprising~~ formula (IV):



(IV)

wherein:

- M is a transition metal selected from group 3, 4, 5, 6 or a lanthanide or an actinide group in the Periodic Table of Elements;
- p is an integer from 0 to 3, wherein p is equal to a formal oxidation state of M minus 2;
- X, is the same or different, and is hydrogen, a halogen, R, OR, OSO₂CF₃, OCOR, SR, NR₂ or PR₂, wherein R is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; or two X can optionally form a substituted or unsubstituted butadienyl radical, or a OR'O group, wherein R' is a divalent radical selected from a C₁-C₄₀ alkylidene radical, a C₆-C₄₀ arylidene

radical, a C₇-C₄₀ alkylarylidene radical or [[and]] a C₇-C₄₀ arylalkylidene radical;

- L is a divalent bridging group selected from a C₁-C₂₀ alkylidene radical, a C₃-C₂₀ cycloalkylidene radical, a C₆-C₂₀ arylidene radical, a C₇-C₂₀ alkylarylidene radical, or a C₇-C₂₀ arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;

- R¹ is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R³ is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R², R⁴ and R⁵, are the same or different from each other, and are hydrogen or C₁-C₄₀ hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among R², R⁴ and R⁵ is hydrogen;

- R⁶ and R⁷, are the same or different from each other, and are hydrogen or C₁-C₄₀ hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R¹⁵ and R¹⁶, are the same or different from each other, and are hydrogen or C₁-C₄₀ hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; and

- R³ with R⁴ and/or R⁴ with R⁵ can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups

13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms.

25. (Currently Amended) The metallocene compound of claim 24, wherein:

- M is titanium, zirconium or hafnium;
- p is 2;
- X is hydrogen, a halogen, or R;

- R is a linear or branched, cyclic or acyclic C₁-C₄₀-alkyl radical, C₂-C₄₀ alkenyl radical, C₂-C₄₀ alkynyl radical, C₆-C₄₀-aryl radical, C₇-C₄₀-alkylaryl radical or C₇-C₄₀-arylalkyl radical, optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

~~- X is hydrogen, a halogen, or R;~~

- L is Z(R'')₂, wherein Z is a carbon or a silicon atom, and R'' is a linear or branched, cyclic or acyclic C₁-C₁₀-alkyl radical, C₂-C₁₀ alkenyl radical, C₂-C₁₀ alkynyl radical, C₆-C₁₀-aryl radical, C₇-C₁₀-alkylaryl radical, or C₇-C₁₀-arylalkyl radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements.

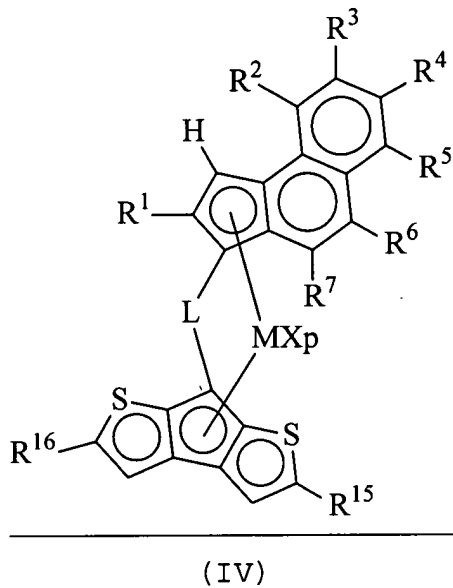
26. (Currently Amended) The metallocene compound of claim 24, wherein:

- R¹ is a linear or branched, ~~saturated or unsaturated~~ C₁-C₂₀-alkyl radical;
- R³ is a linear or branched, ~~saturated or unsaturated~~ C₁-C₂₀-alkyl radical or a C₆-C₄₀-aryl, radical;
- R², R⁴ and R⁵ are hydrogen; and

- R^6 and R^7 are hydrogen or a linear or branched, ~~saturated or unsaturated~~ C_1 - C_{20} -alkyl radical.

27. (Previously Presented) The metallocene compound according to claim 24, wherein R^{15} and R^{16} are linear or branched C_1 - C_{40} -alkyl radicals optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements.

28. (Currently Amended) A process for preparing a metallocene compound of formula (IV):



wherein:

- M is a transition metal selected from group 3, 4, 5, 6 or a lanthanide or an actinide group in the Periodic Table of Elements;
- p is an integer from 0 to 3, wherein p is equal to a formal oxidation state of M minus 2;
- X, is the same or different, and is hydrogen, a halogen, R, OR, OSO_2CF_3 , $OCOR$, SR, NR_2 or PR_2 , wherein R is a C_1 - C_{40} hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the

Periodic Table of Elements; or two X can optionally form a substituted or unsubstituted butadienyl radical, or a OR'O group, wherein R' is a divalent radical selected from a C₁-C₄₀ alkylidene radical, a C₆-C₄₀ arylidene radical, a C₇-C₄₀ alkylarylidene radical or a C₇-C₄₀ arylalkylidene radical;

- L is a divalent bridging group selected from a C₁-C₂₀ alkylidene radical, a C₃-C₂₀ cycloalkylidene radical, a C₆-C₂₀ arylidene radical, a C₇-C₂₀ alkylarylidene radical, or a C₇-C₂₀ arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;

- R¹ is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R³ is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R², R⁴ and R⁵, are the same or different from each other, and are hydrogen or C₁-C₄₀ hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among R², R⁴ and R⁵ is hydrogen;

- R⁶ is hydrogen or C₁-C₄₀ hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R⁷ is hydrogen;

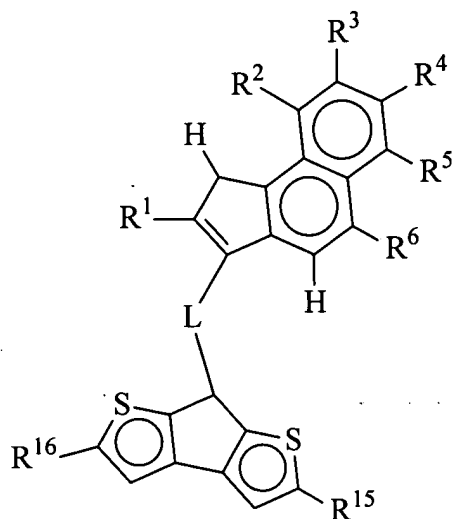
- R¹⁵ and R¹⁶, are the same or different from each other, and are hydrogen or C₁-C₄₀ hydrocarbon groups optionally

comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; and

- R³ with R⁴ and/or R⁴ with R⁵ can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms;

the process comprising:

- contacting a compound of formula (IVa)



(IVa)

and/or its double bond isomers with a base selected from T₃B, TMgT¹, sodium hydride, potassium hydride, metallic sodium, metallic potassium, or [[and]] combinations thereof to form a metallocene compound product, wherein:

- L is a divalent bridging group selected from a C₁-C₂₀ alkylidene radical, a C₃-C₂₀ cycloalkylidene radical, a C₆-C₂₀ arylidene radical, a C₇-C₂₀ alkylarylidene radical, or a C₇-C₂₀ arylalkylidene radical optionally comprising

at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;

- R^1 is a C_1 - C_{40} hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R^3 is a C_1 - C_{40} hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R^2 , R^4 and R^5 , are the same or different from each other, and are hydrogen or C_1 - C_{40} hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among R^2 , R^4 and R^5 is hydrogen;

- R^6 and R^7 , are the same or different from each other, and are hydrogen or C_1 - C_{40} hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R^{15} and R^{16} , are the same or different from each other, and are hydrogen or C_1 - C_{40} hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; and

- R^3 with R^4 and/or R^4 with R^5 can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms.

- B is an alkali or alkaline earth metal;

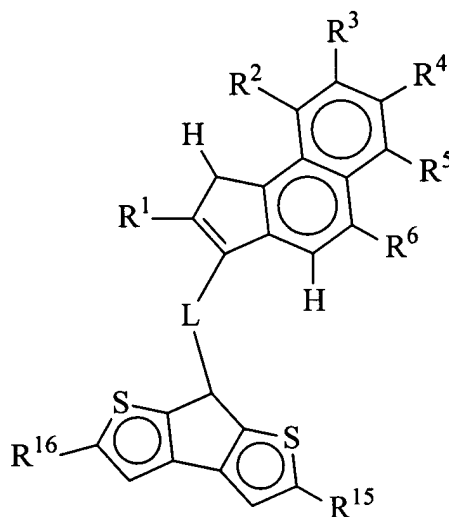
- j is 1 or 2, wherein j is equal to 1 when B is an alkaline metal, and j is equal to 2 when B is an alkali-earth metal;
- T is a linear or branched, cyclic or acyclic C₁-C₂₀-alkyl radical, C₆-C₂₀-aryl radical, C₇-C₂₀-alkylaryl radical, or C₇-C₂₀-arylalkyl radical, optionally comprising one or more Si or Ge atoms;
- T¹ is a halogen or OR'', wherein R'' is a linear or branched, cyclic or acyclic C₁-C₄₀-alkyl radical, C₆-C₄₀-aryl radical, C₇-C₄₀-alkylaryl radical or C₇-C₄₀-arylalkyl radical, optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements ~~to form a metallocene compound product~~, wherein a molar ratio between the base and a ligand of the formula (IVa) is at least 2:1; and
- contacting the metallocene compound product with a compound of formula MX_{p+2}, wherein:
 - M is a transition metal selected from group 3, 4, 5, 6 or a lanthanide or an actinide group in the Periodic Table of Elements;
 - p is an integer from 0 to 3, wherein p is equal to a formal oxidation state of M minus 2; and
 - X, is the same or different, and is hydrogen, a halogen, R, OR, OSO₂CF₃, OCOR, SR, NR₂ or PR₂, wherein R is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; or two X can optionally form a substituted or unsubstituted butadienyl radical, or a OR'O group, wherein R' is a divalent radical selected from a C₁-C₄₀ alkylidene radical, a C₆-C₄₀ arylidene radical, a C₇-C₄₀ alkylarylidene radical [[and]] or a C₇-C₄₀ arylalkylidene radical.

29. (Previously Presented) The process for preparing the metallocene compound of claim 28, wherein B is lithium.

30. (Previously Presented) The process for preparing the metallocene compound of claim 28, wherein T is a methyl radical or butyl radical.

31. (Cancelled)

32. (Currently Amended) A ligand of formula (IVa) and its double bonds isomers



(IVa)

wherein:

- L is a divalent bridging group selected from a C₁-C₂₀ alkylidene radical, a C₃-C₂₀ cycloalkylidene radical, a C₆-C₂₀ arylidene radical, a C₇-C₂₀ alkylarylidene radical, or a C₇-C₂₀ arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;

- R¹ is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R³ is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R², R⁴ and R⁵, are the same or different from each other, and are hydrogen or C₁-C₄₀ hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among R², R⁴ and R⁵ is hydrogen;
- ~~- R⁶, are the same or different from each other, and are~~
is hydrogen or C₁-C₄₀ hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R³ with R⁴ and/or R⁴ with R⁵ can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms; and
- R¹⁵ and R¹⁶, are the same or different from each other, and are hydrogen or C₁-C₄₀ hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements.

33. (Previously Presented) The ligand of claim 32, wherein:

- L is Z(R'')₂, wherein Z is a carbon or a silicon atom, and R'' is a linear or branched, cyclic or acyclic C₁-C₁₀-alkyl radical, C₂-C₁₀ alkenyl radical, C₂-C₁₀ alkynyl

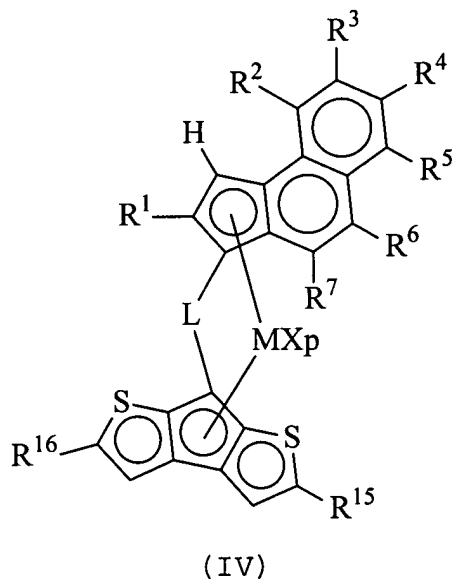
radical, C₆-C₁₀-aryl radical, C₇-C₁₀-alkylaryl radical, or C₇-C₁₀-arylalkyl radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

34. (Currently Amended) The ligand of claim 32, wherein:

- R¹ is a linear or branched, ~~saturated or unsaturated~~ C₁-C₂₀-alkyl radical;
- R³ is a linear or branched, ~~saturated or unsaturated~~ C₁-C₂₀-alkyl radical or a C₆-C₄₀-aryl, radical;
- R², R⁴ and R⁵ are hydrogen; and
- R⁶ and ~~R⁷~~ are is hydrogen or a linear or branched, ~~saturated or unsaturated~~ C₁-C₂₀-alkyl radical.

35. (Currently Amended) A catalyst system obtained by contacting:

- a) at least one metallocene compound of formula (IV)



wherein:

- M is a transition metal selected from group 3, 4, 5, 6 or a lanthanide or an actinide group in the Periodic Table of Elements;
- p is an integer from 0 to 3, wherein p is equal to a formal oxidation state of M minus 2;
- X, is the same or different, and is hydrogen, a halogen, R, OR, OSO₂CF₃, OCOR, SR, NR₂ or PR₂, wherein R is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; or two X can optionally form a substituted or unsubstituted butadienyl radical, or a OR'O group, wherein R' is a divalent radical selected from a C₁-C₄₀ alkylidene radical, a C₆-C₄₀ arylidene radical, a C₇-C₄₀ alkylarylidene radical or [[and]] a C₇-C₄₀ arylalkylidene radical;
- L is a divalent bridging group selected from a C₁-C₂₀ alkylidene radical, a C₃-C₂₀ cycloalkylidene radical, a C₆-C₂₀ arylidene radical, a C₇-C₂₀ alkylarylidene radical, or a C₇-C₂₀ arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;
- R¹ is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R³ is a C₁-C₄₀ hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R², R⁴ and R⁵, are the same or different from each other, and are hydrogen or C₁-C₄₀ hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with

the proviso that at least one among R^2 , R^4 and R^5 is hydrogen;

- R^6 and R^7 , are the same or different from each other, and are hydrogen or C_1 - C_{40} hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R^{15} and R^{16} , are the same or different from each other, and are hydrogen or C_1 - C_{40} hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; and

- R^3 with R^4 and/or R^4 with R^5 can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms;

b) at least one alumoxane, or a compound able to form an alkylmetallocene cation; and

c) optionally an organo aluminium compound.

36. (Cancelled)

37. (Currently Amended) A process for (co)polymerizing olefins comprising from 2 to 20 carbon atoms comprising contacting one or more of the olefins under polymerization conditions ~~in presence of~~ with the catalyst system of claim 35.

38. (Cancelled)

39. (Previously Presented) The process according to claim 37, wherein the olefins are alpha-olefins comprising from 2 to 20 carbon atoms.

40. (Cancelled)

41. (Currently Amended) The process according to claim 37, wherein the olefins are selected from propylene, ethylene, 1-butene, or **[[and]]** combinations thereof.

42. (Cancelled)